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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/775,167	02/01/2001	Yasushi Kubota	55561 (70820)	7275

21874 7590 09/15/2008

EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
KUMAR, SRILAKSHMI K	

ART UNIT	PAPER NUMBER
2629	

MAIL DATE	DELIVERY MODE
09/15/2008	PAPER

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/775,167
Filing Date: February 01, 2001
Appellant(s): KUBOTA ET AL.

Steve Jensen
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed July 3, 2008 appealing from the Office action mailed September 21, 2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,289,518	Nakao
5,572,211	Erhart et al.
5,602,561	Kawaguchi et al.
5,111,190	Zenda

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-5, 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao (U.S. Patent No. 5,289,518) in view of Applicant's Admitted Prior Art (hereinafter, AAPA).

With reference to **claims 1 and 25**, Nakao teaches a shift register circuit provided with a plurality of register blocks each having a flip flop (31-34) that operates in synchronization with a clock signal (CK1) (see column 3, lines 31-36), and a transfer gate (NAND, CK1) for controlling the clock signal supplied to the flip-flop (see column 4, lines 1-7); the plurality of register blocks being serially connected together (see Figure 4), and the transfer gate (NAND, CK1) of a corresponding register block being brought into an ON-state only in a specified period during which an output of the flip-flop of the corresponding register block changes (see Figure 5). With

further reference to claim 25, Nakao teaches the use of a control circuit (35) for outputting a control signal to each of the transfer gates (see column 3, lines 39-41).

Nakao does not teach where it is the input control signal of the transfer gate being brought into an ON-state when the output of the flip-flop of the corresponding changes. AAPA teaches this feature in Figs. 41A-J, and pages 6-8 of the specification, where ctl1 corresponds to out1, ctl2 corresponds to out2, etc.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include this feature of the input control signal corresponding to the output signal into Nakao as taught by AAPA as this feature decreases cost (page 6, lines 18-page 7, lines 2).

With reference to **claim 2**, Nakao teaches that when the level of the input signal inputted to each register block and the level of the output signal outputted from the register block differ from each other, the transfer gate of the register block is brought into an ON-state (see Figure 5).

With reference to **claim 3**, Nakao teaches that the flip-flop is a D-type flip-flop (see Figure 4), and the register block (31-34) has a logic operation section (61-64) for executing a logic operation of an input signal (data signal) of the register block, an output signal (Q) of the register block and controls the transfer gate to be turned on and off based on a signal representing a logic operation result of the logic operation section (see column 3, lines 37-58).

With reference to **claim 4**, Nakao fails to teach the usage of an SR-type flip-flop, however the examiner takes official notice that usage of an SR-type flip-flop is well known in the art. It would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of an SR-type flip-flop as opposed to the D-type flip-flop, as these

types of flip-flops are interchangeable or combine with one another in order to provide an alternative method for reducing power consumption in the shift register.

With reference to **claims 5 and 14**, Nakao teaches that the register block receives inputs (CK1) to a clock input terminal of the flip-flop of the register block for bringing the output of the flip-flop into a retained state in a period during which the transfer gate is in an OFF-state (see Figure 5). Nakao teaches in Fig. 5, where the flip-flop is in a retained state in a period during which the transfer gate is in an OFF-state.

3. ***Claims 6, 9-12, 17-19, and 22-24*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao in view of AAPA as applied to **claim 1-5, 14, *and 25*** above, and further in view of Erhart et al. (U.S. Patent No. 5,572,211).

With reference to **claims 6, 9-11, 19, and 22-24**, while teaching the usage of a shift register as explained above; Nakao fails to specifically teach the details of the display device for which the shift register is used.

With reference to **claims 6 and 19**, Erhart et al. teaches that a shift register is used in a liquid crystal display scanner to generate horizontal sampling pulses comprising a plurality of pixels arranged in a matrix form (20), a plurality of data signal lines for supplying image data to be written into the plurality of pixels, a plurality of scanning signal lines for controlling the image data to be written into the pixels, a data signal line drive circuit for driving the data signal lines and a scanning signal line drive circuit for driving the scanning signal lines (see column 6, lines 17-54; Figures 1-2).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of the display device similar to that which is conventional in the

art as taught by Erhart to be used as the display device for the shift register taught by Nakao in order to thereby provide a display device wherein lower power consumption of the shift register can be achieved.

With further reference to **claims 9-11 and 22-24** Nakao and Erhart et al. fail to specifically teach that the data signal line and the scanning signal line drive circuits are formed on a substrate identical to that of the plurality of pixels. However, the examiner takes Official Notice that the data and scanning signal line drive circuits to be formed on the same substrate as the plurality of pixels is well known in the art, as well as a polysilicon thin film transistor as the active element of the drive circuit and the temperature range for forming the TFT on the glass substrate is well known in the art.

It would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of a substrate wherein the driver circuits consisting of polysilicon thin film transistors and the plurality of pixels are formed thereon in order to thereby reduce fabrication cost while improving the driving of the device.

With reference to **claims 12, 13, and 15**, Nakao fails to teach that the shift register circuit includes a level shifter for shifting the level of the clock signal a level not lower than the clock signal input level of the flip-flop; wherein the level shift circuit is brought into an operating state every register block when the flip-flop changes; that when the level of the input signal and the level of the output signal from the register block are different the transfer gate is brought into an ON-state and level shift circuit is brought into an operating state; and OFF-state signal circuit that inputs to the clock input terminal of the level shift circuit an OFF-state signal of a level at

which no current flows through the level shift circuit in the period during which the transfer gate is in the OFF-state.

Erhart et al teach an integrated circuit for generating output voltages for a series of column driver output circuits used to drive a LCD display (see abstract). The column driver circuit includes a level shift block (166) for shifting the level of the clock signal so that the level of the clock signal becomes not lower than the clock signal input level of the flip-flop; wherein the clock signal is level shifted to provide a level shifted clocking signal which is coupled to the clock input terminals of each of the flip flops of the shift reregister (158) (see column 10, lines 20-30). Further it is taught that when the level of the input signal and the level of the output signal from the register block are different the transfer gate is brought into an ON-state and level shift circuit is brought into an operating state (see column 10, lines 39-62); and OFF-state signal circuit that inputs to the clock input terminal of the level shift circuit an OFF-state signal of a level at which no current flows through the level shift circuit in the period during which the transfer gate is in the OFF-state (column 10, lines 30-38). With further reference to **claim 16**, Erhart et al teach that the level shift circuit (166) is connected to a power source line (VDD) and a ground line (VSS), and the register block has a disconnecting circuit for disconnecting either one of the power source line and the ground line of the level shift circuit in the period during which the transfer gate is in the OFF-state (see column 10, line 20-62).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of the level shifter as taught by Erhart et al. in a system similar to that which is taught by Nakao to thereby provide an integrated circuit for an LCD wherein the

shift register circuit is operated at a lower voltage, thereby allowing power consumption to be further reduced.

With reference to **claims 17 and 18**, Nakao teaches that the flip-flop is a D-type flip-flop (see Figure 4), and the register block (31-34) has a logic operation section (61-64) for executing a logic operation of an input signal (data signal) of the register block, an output signal (Q) of the register block and controls the transfer gate to be turned on and off based on a signal representing a logic operation result of the logic operation section (see column 3, lines 37-58).

Nakao fails to teach the usage of an SR-type flip-flop, however the examiner takes official notice that usage of an SR-type flip-flop is well known in the art. It would have been obvious to one having ordinary skill in the art at the time of the invention to allow the usage of an SR-type flip-flop as opposed to the D-type flip-flop, as these types of flip-flops are interchangeable or combine with one another in order to provide an alternative method for reducing power consumption in the shift register.

4. **Claims 7 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao in view of AAPA in view of Erhart et al as applied to **claims *6, 9-12, 17-19, and 22-24*** above, and further in view of Kawaguchi et al. (U.S. Patent No. 5,602,561).

With reference to **claims 7 and 20**, Nakao as modified by AAPA and Erhart et al teach all that is required as explained above however fails to teach that the output pulse width of the data signal line drive circuit is controlled by controlling a pulse width of the input signal.

Kawaguchi et al. teaches that an output pulse width of the data signal line drive circuit is controlled by controlling a pulse width of an input signal (s) inputted to the register block of the first stage of the shift register circuit (see column 4, lines 39-46).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the adjusting the output pulse width of the data signal line drive circuit similar to that which is taught by Kawaguchi et al. to be used in a device similar to that which is taught by Nakao in order to thereby provide a display device which will operate more efficiently.

5. **Claims 8 and 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao in view of AAPA and Erhart et al and Kawaguchi et al. as applied to **claim 7 and 20** above, and further in view of Zenda (U.S. Patent No. 5,111,190).

With reference to **claims 8 and 21**, while teaching all that is required as explained above there fails to be any disclosure in Nakao as modified by AAPA, Erhart et al and Kawaguchi et al., of generating a side black region displayed on an upper side and lower side of the display screen by writing black while increasing the pulse width of the input signal.

Zenda teaches a side black region is displayed on an upper side and a lower side of an image display screen (see Figures 1-7) by writing a black signal into all the data signal lines while increasing the pulse width of the input signal inputted to the register block of the first stage of the shift register circuit so that all the data signal lines are brought into an active state by the data signal line drive circuit (see column 4, lines 44-59).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to allow the display of non-display data by increasing the pulse width, similar to that which is taught by Zenda, in a device similar to that which is taught by Nakao, AAPA, Erhart et al , and Kawaguchi et al. in order to thereby provide a display device which provides non-display regions wherein the display device consumes less power.

(10) Response to Argument

Appellant argues that there is no teaching or suggestion in the proposed combination of Nakao in view of AAPA of a shift register circuit in which an input control signal of a transfer gate of a corresponding register block is brought into an ON-state only in a specified period when an output of the corresponding flip flop changes. Examiner, respectfully disagrees.

Appellant, further, argues where in Figs. 41C & 41D, the control signal CTL1 remains in an ON-state during the entire period in which the output OUT1 of the flip flop is active and thus is not limited to the time period in which the output of the flip flop changes. Examiner, respectfully, disagrees. AAPA teaches where the control signal is brought into an ON-State when the output of the flip-flop changes as shown in Figs. 41C & 41D. The control signal stays on during the entire period, then turns off. The control signal then turns on again when the flip flop changes in the next cycle to the on state. Thus, teaching where the control signal changes when the flip flop changes. The claim limitations recite only that the control signal is brought into an ON-state when the output of the flip-flop changes, but they do not recite anything with regard to what happens to the control signal afterwards. There is no requirement in the claim that the control signal be brought out of the ON-state, or turned OFF, before the flip flop changes. Further, the limitations do not teach where the control signal changes *each and every time* the flip flop changes. Therefore, as broadly interpreted, the prior art of Nakao in combination with AAPA teach the limitations of a shift register circuit in which an input control signal of a transfer gate of a corresponding register block is brought into an ON-state only in a specified period when an output of the corresponding flip flop changes.

With respect to the remaining claims 6, 9-12, 17-19 and 22-24 are taught by the combination of Nakao in view of AAPA and in further view of Erhart. Claims 7 and 20 are taught by the combination of Nakao in view of AAPA and Erhart and further in view of Kawaguchi. Claims 8 and 21 are taught by the combination of Nakao in view of AAPA and Erhart and Kawaguchi and further in view of Zenda.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Srilakshmi K Kumar/
Patent Examiner, Division 2629

Conferees:

/Amr Awad/
Supervisory Patent Examiner, Art Unit 2629

/Sumati Lefkowitz/
Supervisory Patent Examiner, Art Unit 2629